

CLAIMS

1. Apparatus (2) for converting power from a power input (4) to an output (6, 8) power supply, which apparatus (2) comprises a resonance converter containing at least two serial coupled semiconductor switches (10, 12) having at least one common output terminal (14) connected to at least one first coil (15), connected to a coil 16 which is part of a transformer (18) having a second coil (20) connected to rectifier means (20), which rectifier means (20) has its output (24) connected to output terminals (6, 8), where a first feedback circuit (26) is connected from the output terminal (6) to an error amplifier (28), which error amplifier (28) is connected to an input (31) at a control circuit (34,134), which comprises output (36) that is connected over driver means (38, 40) to the input (43, 45) of the semiconductor switches (10, 12), where the apparatus further comprises a second feedback circuit (50) where the second feedback circuit (50) is leading a signal from at least one capacitor(s) C_p (19), which capacitor is connected in serial to the first coil (15) to an input terminal (32,132) **characterised in**, that the second feedback circuit is connected to the input terminal (32,132) of the control circuit (34,134), which input terminal (32,132) is connected to at least one capacitor (46,62,66,68), which capacitor (46,62,66,68) is controlling the switching frequency, which second feedback circuit (50) comprises a signal depending on the actual change of the charge over the serial resonance capacitor C_p (19) in each half period of switching, which linearizes the influence of the first feedback circuit (26)
2. Apparatus according to claim 1, **characterised in** that the second feedback circuit (50) is connected from the serial resonance capacitor C_p (19) to at least one capacitor (52) where at least one further capacitor (54) is connected to a common ground (56).
3. Apparatus according to claim 1 or 2, **characterised in** that the second feedback circuit (50) contains an inverting amplifier (60), which output is connected to the input terminal (32) through at least one capacitor (62).
4. Apparatus according to claim 3, **characterised in** that the output from the inverting amplifier (60) is connected to a serial connection of a resistor (64) and a fur-

ther capacitor (66), which serial connection I is coupled in parallel to the capacitor (62).

- 5 5. Method for power conversion control in serial resonance switch mode power converters operating in frequency mode at normal operation where a first feedback signal, from the output, is converted to an input to switching means **c h a r a c t e r i s e d** in that a second feed back signal is used to influence the charging and discharging of at least one capacitor connected to the oscillating circuit, where by increasing load, the mode of operation is changed into a charge mode control by a second feedback signal,
- 10 which second feedback signal is based on the actual charging current and thereby change in charge in each half period of switching on the serial resonant capacitor(s) $C_p, C_{p'}$.